

WHAT IS CLAIMED IS:

1. A method of optimizing a query in a computer system, the query being performed by the computer system to retrieve data from a database stored on the computer system, the method comprising:
 - 5 (a) during compilation of the query, maintaining a GROUP BY clause with one or more GROUPING SETS, ROLLUP or CUBE operations in its original form until after query rewrite; and
 - (b) translating the GROUP BY clause with the GROUPING SETS, ROLLUP or CUBE operations into a plurality of levels having one or more grouping sets.

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2. The method of claim 1, further comprising:
 - (1) after compilation of the query, dynamically determining a grouping sets sequence for the GROUP BY clause with the GROUPING SETS, ROLLUP or CUBE operations based on intermediate grouping sets, in order to optimize the grouping sets sequence.
 - 15 (2) optimizing execution of the grouping sets sequence by selecting a smallest grouping set from a previous one of the levels as an input to a grouping set on a next one of the levels.
3. The method of claim 2, further comprising performing a UNION ALL operation on the grouping sets.

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4. A computer-implemented apparatus for optimizing a query, the query being performed to retrieve data from a database, the apparatus comprising:
 - 25 (a) a computer system;
 - (b) logic, performed by the computer system, for
 - (1) during compilation of the query, maintaining a GROUP BY clause with one or more GROUPING SETS, ROLLUP or CUBE operations in its original form until after query rewrite; and
 - (2) translating the GROUP BY clause with the GROUPING SETS, ROLLUP or CUBE operations into a plurality of levels having one or more grouping sets.

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5. The apparatus of claim 4, further comprising logic for:

(1) after compilation of the query, dynamically determining a grouping sets sequence for the GROUP BY clause with the GROUPING SETS, ROLLUP or CUBE operations based on intermediate grouping sets, in order to optimize the grouping sets sequence.

5 (2) optimizing execution of the grouping sets sequence by selecting a smallest grouping set from a previous one of the levels as an input to a grouping set on a next one of the levels.

6. The apparatus of claim 5, further comprising logic for performing a UNION

10 ALL operation on the grouping sets.

7. An article of manufacture embodying logic for performing a method for optimizing a query, the query being performed by a computer system to retrieve data from a database stored in a data storage device coupled to the computer system, the method

15 comprising:

(a) during compilation of the query, maintaining a GROUP BY clause with one or more GROUPING SETS, ROLLUP or CUBE operations in its original form until after query rewrite; and

(b) translating the GROUP BY clause with the GROUPING SETS, ROLLUP or

20 CUBE operations into a plurality of levels having one or more grouping sets.

8. The article of manufacture of claim 7, further comprising:

(1) after compilation of the query, dynamically determining a grouping sets sequence for the GROUP BY clause with the GROUPING SETS, ROLLUP or CUBE operations based on intermediate grouping sets, in order to optimize the grouping sets sequence.

(2) optimizing execution of the grouping sets sequence by selecting a smallest grouping set from a previous one of the levels as an input to a grouping set on a next one of the levels.

30 9. The article of manufacture of claim 8, further comprising performing a UNION ALL operation on the grouping sets.